REMARKS

This application was filed with Claims 1-54. Claims 1-7 and 9-54 are now pending in the application.

In the Office Action, Claims 13-20, 25, 30, and 35-54 are allowed; Claims 9, 10 and 12 are objected to; and Claims 1-8, 11, 21-24, 26-29, and 31-34 are rejected.

Claims 9-54 are not rejected on the basis of art for any reason.

REJECTION UNDER 35 U.S.C. § 112

Claims 11, 21-24, 26-29, and 31-34 were rejected under 35 U.S.C. § 112 on the basis of informalities. Appropriate correction has been made to enhance clarity as follows.

Claim 11 was objected to on the basis of the term "control valve." This has been corrected. The same correction was made to Claim 7.

It is noted that Claims 21-24, 26-29 and 31-34 were drawn to a control system. It should recite "fuel processing system." Appropriate correction has been made.

The preamble of other claims have also been corrected for better uniformity.

REJECTION UNDER 35 U.S.C. § 102(b)

Claims 1-3 and 8 are rejected under 35 U.S.C. § 102(b) on the basis of Sasaki (USPN 4,642,273). It is said that Sasaki discloses a fuel cell, including a system in which a fuel processor produces reformate that is supplied to a fuel cell via an outlet line, which includes valve 7c. The Opinion states that since the output valve may have

its position varied and be at times partially closed, the reformer will act as a storage buffer.

It is respectfully submitted that the arrangement of Sasaki does not function to provide a reformer which is capable of functioning as a storage buffer. Actually, Sasaki teaches the exact opposite. Sasaki teaches that as the load demand on the fuel cell changes, a control system adjusts system pressure in order to achieve as close to steady state as possible pressure condition in the reformer. Such systems include a pressure control means that determines a transitional predicted pressure level and which detects actual pressure and which adjusts pressure to achieve the near steady state condition. See Sasaki at Column 3, Lines 15-30 and 45-60; see also Claim 1 of Sasaki, which emphasizes the same feature as stated in the Abstract.

The above configuration and arrangement of the control system in Sasaki is summarized in the Abstract, where it is stated that, in order to operate in a transient condition, a control system transitionally reduces the pressure in the reformer reactor when there is a sudden decrease of load.

It is clear that Sasaki operates by maintaining a nominal pressure level in the reformer and by decreasing the pressure in the reformer by opening valve 7c in order to not have a back-pressure in the reactor. Sasaki operates to avoid the reactor functioning as a storage buffer. This is the opposite of the present invention.

Claim 1 has been amended herewith to emphasize these distinguishing features where the fuel processor system has a valve that controls the flow rate of the reactor discharge, which cooperates with a reactor input stream having a control device, where such control device and valve cooperate to provide an increasing back-pressure in the

fuel processor when the valve is at least partially closed. The result is that the fuel processor acts as a storage buffer.

Claims 2 and 3 are submitted to meet the criteria for novelty for the reasons given with respect to amended Claim 1.

Claim 8 has been cancelled and its features incorporated in amended Claim 1.

REJECTION UNDER 35 U.S.C. § 102(e)

Claims 1 and 8 were rejected under 35 U.S.C. § 102(e) as being anticipated by Kato et al. (USPN 6,569,552).

It is said that Kato discloses a fuel cell, including a fuel processor that provides hydrogen fed to a stack via line 505a connecting the fuel processor 120 outlet and including a valve 505 on line 505a.

The premise of the rejection is that since the output valve may be opened and closed, the Office Action assumes the position may be varied and, therefore, cause the reformer to act as a storage buffer.

It is respectfully submitted that Claim 1, as amended, is not anticipated by Kato et al., because Kato does not show a controller modulating a valve to control the flow rate of the reformate discharged from the fuel processor, which cooperates with the control device of the input stream to provide an increasing back pressure in the fuel processor when the valve is at least partially closed in order to cause the fuel processor to act as a storage buffer, as in the present invention.

A careful reading of Kato reveals that the features as recited in amended Claim 1 are nowhere present. Further, Kato does not anticipate the elements of original Claim

1, since Kato does not include a controller modulating a valve to control a flow rate of the reformate discharged from the fuel processor.

Kato is not relevant to the present invention, because Kato's valve 505 does not control flow rate of reformate discharge from the reactor. Valve 505 only adjusts flow to the stack by venting reformate. Kato shows the valve 505 only has opened and closed positions. In the event that the demand for reformate in the stack is less then the amount of reformate being generated by the hydrogen generator system 100, then, such excess is vented to the atmosphere from the hydrogen generator system via line 411. Therefore, since reformate is being exhausted to the atmosphere in an oversupply condition, there is no fuel processor acting as a storage buffer. See Kato, Column 3, Lines 48-60 and Column 4, Lines 6-12.

At Column 4, Lines 45-55, Kato describes that residual hydrogen is a situation to be avoided by terminating production of hydrogen.

In another alternative, Kato, at Figures 12-15, shows that when valve 505 is closed, reformate does not build up in back pressure back to the hydrogen generator; rather, reformate is recirculated continuously through the stack.

In yet another alternative, according to Kato Figure 17 and Column 10, it is stated that any change in flow requirement for the stack is accommodated by a pressure buffer chamber 801 provided downstream of the fuel processor and/or by buffer chamber 800 provided downstream of the stack.

Kato provides possibilities for avoiding any back pressure in the hydrogen generator system and particularly the fuel processor. Kato avoids utilizing a fuel processor as a storage buffer. Therefore, in no arrangement or mode of operation does

Kato utilize the fuel processor as a storage buffer. Further, Kato does not provide the arrangement of system components as defined in the present claims, as amended, to achieve such result.

REJECTION UNDER 35 U.S.C. § 103(a)

Claims 4-7 are rejected under 35 U.S.C. § 103(a) as being obvious over Sasaki in view of Acker (USPN 6,322,917).

The basis for the obviousness rejection is that, although Sasaki does not disclose the various types of reformers as set forth in Claims 4-7 herein, Acker supplies the deficiencies of Sasaki.

It is respectfully submitted that Acker does not supply the deficiency of Sasaki with respect to Claim 4, since Sasaki does not show the arrangement of a partial oxidation reformer, a water gas shift reactor and the valve of the present invention, arranged in the order stated in Claim 4. Acker provides no suggestion as to the order of placement of the reactor and there is no suggestion that the water gas shift reactor be located between the partial oxidation reformer and the valve.

Claim 5 recites that the fuel processor includes an auto thermal reformer and a water gas shift reactor located between the auto thermal reformer and the valve. There is no suggestion in Acker that the water gas shift reactor be located between the auto thermal reformer and the valve.

Claim 6 is rejected on the basis that Acker shows a fuel processor that includes an auto thermal reformer and a steam reforming reactor. However, Acker merely recites that there are a variety of reactors. There is no suggestion in Acker that any

combination of reactors is possible. To the contrary, Acker suggests that a single type of reactor be selected for reforming.

With regard to Claim 7, there is no suggestion in Acker that two different types of reactors might be combined, let alone such reactors operated in parallel between an inlet stream and the control valve.

It is respectfully submitted that Claims 4-7, in combination with the features of Claim 1, are distinguished over Acker in combination with Sasaki.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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By: _____
Linda M. Deschere
Reg. No. 34,811

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

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